

## How the internet moves data

40 minutes

Strand 2: Let's get connected

Outcome 2.1

Outcome 2.2

### WHAT THIS LESSON DOES

Explore how a message travels from your device to a server when loading a webpage. Order the journey steps yourself and observe real network traffic to learn about packets, routers and protocols.

### CURRICULUM OUTCOMES

| Outcome | What the specification asks for                       |
|---------|-------------------------------------------------------|
| 2.1     | Discuss the basic concepts underpinning the internet. |
| 2.2     | Describe how data is transported through protocols.   |

### WHAT STUDENTS SHOULD BE ABLE TO DO

- Discuss the basic concepts underpinning the internet, and how a message gets from one device to another (LO 2.1)
- Describe in simple terms how data is transported on the internet and how devices communicate through protocols (LO 2.2)

### BEFORE THE BELL

- Review the flow of the interactive activity in advance.
- Practise opening the Network tab on the class browser and prepare a one-line cheat-sheet for the board.
- Optional: prepare a simple Network waterfall screenshot or print so pairs can annotate if the live list is hard to read from the back.
- Student devices with browser access
- Student devices with browser access; know how to open Network tools on the class browser; one-line cheat-sheet ready on the board; optional Network waterfall screenshot or print for pairs

## How the internet moves data

### HOW THE LESSON RUNS

|               |              |                                    |
|---------------|--------------|------------------------------------|
| <b>4 min</b>  | introduction | Start                              |
| <b>4 min</b>  | content      | A message leaves your device       |
| <b>2 min</b>  | content      | Why devices have to agree on rules |
| <b>13 min</b> | activity     | Hands-on: put the journey in order |
| <b>6 min</b>  | activity     | Watch a real page load             |
| <b>5 min</b>  | content      | Note three things as you watch     |
| <b>2 min</b>  | content      | Make sense                         |
| <b>1 min</b>  | content      | What a protocol does               |
| <b>2 min</b>  | content      | Reflect                            |
| <b>1 min</b>  | summary      | What you covered                   |

### TEACHING MOVES

- Demonstrate how to drag the cards on the interactive before students start.
- Circulate during the ordering activity and listen for use of key terms.
- Always model the Network tab on the board first; run three short pair call-outs (count, file type, slowest time) rather than a long silent watch.
- Keep the three labelled observation prompts on screen during the page-load watch.
- In Make sense, take one quick answer to the protocol check prompt before Reflect.
- Limit the reflect discussion to two or three student responses.

### WHAT TO WATCH FOR

- Students place the packet creation after routing. Solution: Emphasise that packets are formed on the device first.
- Students cannot locate the Network tab. Solution: Stay with the projected demo; solo use is extension only.
- Students expect one request for the whole page. Solution: Point out the multiple entries in the network list.
- Students call each Network-tab row a packet. Solution: A row is a request for a file; packets are the small chunks inside each request.
- Students treat "protocol" as a device or a place. Solution: Bring them back to "agreed rules" and the HTTP example.

#### **DIFFERENTIATION**

- Support: Let students work in pairs for the journey ordering task.
- Extension: In the Network tab, find the slowest request. Ask: was it an image, a script, or the page itself, and what would a user notice if that one request failed?
- Support: Provide a reference list of the main terms for the activity.
- Support during Watch: give pairs the printed waterfall so they can tick off the three prompts even if they cannot see the board clearly.